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DRAFT ENVIRONMENTAL IMPACT STATEMENT

# RUTHERFORD-WILLIAMSON-DAVIDSON POWER SUPPLY IMPROVEMENT PROJECT

**Rutherford, Williamson, and Maury Counties, Tennessee**

TENNESSEE VALLEY AUTHORITY

SEPTEMBER 2007

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**Environmental Impact Statement** **September 2007**

**Proposed project:** Rutherford-Williamson-Davidson
Power Supply Improvement Project
Rutherford, Williamson, and Maury Counties, Tennessee

**Lead agency:** Tennessee Valley Authority

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**Comments must be submitted by:** November 20, 2007

**Abstract:** The Tennessee Valley Authority (TVA) proposes to construct and operate a new 500-kilovolt (kV) Rutherford Substation, a new 27-mile 500-kV transmission line and two new 9- and 15-mile 161-kV transmission lines in Rutherford, Williamson, and Maury counties. The electrical load growth in this area, including Murfreesboro, Franklin, and surrounding areas of Middle Tennessee, will soon exceed the capacity of the three 500-kV substations and several of the 161-kV transmission lines serving the area by 2010. The environmental impact statement (EIS) considers three solutions based on the construction of or upgrades to a 500-kV substation and associated transmission lines that technically meet the power supply needs of the system. It also considers a solution of increased load management and conservation. Only one of these solutions, involving the new Rutherford Substation and associated transmission lines, can feasibly address this need. The proposed 500-kV transmission line would connect TVA's Maury 500-kV Substation near Columbia, Tennessee, with the new Rutherford 500-kV Substation in southwest Rutherford County. The 161-kV transmission lines would connect the new substation with Middle Tennessee Electric Membership Corporation's Christiana and Almaville 161-kV substations and TVA's Murfreesboro-Triune-East Franklin 161-kV Transmission Line. Most of the 500-kV line would be built on TVA-owned, vacant transmission line right-of-way, as would about 6 miles of the 161-kV lines. The effects of the Action Alternative, as well as the No Action Alternative, are discussed in this draft EIS. Following public review of this draft EIS, TVA will appropriately refine analyses and issue a final EIS.

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# SUMMARY

This summary covers the major points of the environmental impact statement (EIS) prepared for the Rutherford-Williamson-Davidson Power Supply Improvement Project proposed by the Tennessee Valley Authority (TVA). The proposed new substation and transmission line project would originate at TVA's Maury 500-kilovolt (kV) Substation near Columbia, Tennessee. The new 500-kV transmission line would terminate at a new 500-kV substation in southwest Rutherford County. Three new 161-kV transmission lines would originate at the new 500-kV substation. The first would terminate at Middle Tennessee Electric Membership Corporation's (MTEMC) Christiana 161-kV Substation. The second would terminate at MTEMC's Almaville 161-kV Substation. The third would parallel the second transmission line terminating as a connection to TVA's Murfreesboro-Triune-East Franklin 161-kV Transmission Line. This EIS has been prepared to assist TVA in meeting the requirements of the National Environmental Policy Act, including informing the public and TVA decision makers about the potential impacts of the proposed action.

## PURPOSE OF AND NEED FOR ACTION

The population in Murfreesboro, Franklin, and surrounding areas of Middle Tennessee has grown at a rate of 4.3 percent per year since 1990. TVA supplies bulk electricity to this area through its Davidson, Pinhook, and Wilson 500-kilovolt (kV) substations. As a result of the rapid population growth, the electrical load for this area has grown by about 3.5 percent per year and is expected to exceed the capacity of the three 500-kV substations serving the area by 2010. Several 161-kV transmission lines serving the area from these substations are also expected to become overloaded by 2010. Unless action is taken to address these problems, TVA's ability to continue to provide reliable electric service will be undermined, and service to entities and persons who rely on TVA electric power will be degraded and disrupted more frequently and for longer periods.

TVA has studied these problems and concluded that the best method of remedying them is either to construct a new 500-kV substation or expand an existing 500-kV substation. The solution would also require the construction and operation of new 500-kV and 161-kV transmission lines and/or upgrades to existing transmission lines. TVA has prepared this EIS to address the alternatives for meeting this increasing demand for electrical power in Middle Tennessee.

## ALTERNATIVES

After identifying the need for increased high-voltage transmission capacity, TVA evaluated the following four solutions to meet this need.

1. Construct and operate a new 500-kV substation in southwest Rutherford County, 25-30 miles of 500-kV transmission line on vacant, TVA-owned right-of-way (ROW), and about 23 miles of new 161-kV transmission lines in Rutherford, Maury, and Williamson counties.

2. Construct and operate a new 500-kV substation in northeast Williamson County near Brentwood and upgrade about 126 miles of existing 161-kV transmission lines. The transmission lines to be upgraded are in Davidson, Rutherford, Williamson, Sumner, Coffee, Franklin, and Bedford counties.

3. Expand TVA's Pinhook 500-kV Substation in southeast Davidson County and upgrade of about 134 miles of existing 161-kV transmission lines. These transmission lines are located in Davidson, Rutherford, Williamson, Sumner, Wilson, Franklin, and Bedford counties.

4. Rely on load management and conservation by achieving a reduction in current peak loads by at least 800 megawatts.

Further evaluation of these four potential solutions eliminated all but the first. The other two construction solutions had higher overall costs, engineering problems, and problems in meeting the 2010 in-service date. The load management/conservation solution would not achieve the necessary load reduction by 2010 or address the risk to reliability resulting from future system load growth.

The alternatives evaluated in this EIS are the following:

Under Alternative 1, the No Action Alternative, TVA would not address the forecast high-voltage transmission capacity problem by implementing any of the potential solutions identified above. This would make existing electrical supplies unstable and increase likelihood of both planned and unplanned power outages in the Middle Tennessee area as the demand continued to grow.

Under Alternative 2, TVA would construct and operate a new 500-kV substation in southwest Rutherford County and associated 500-kV and 161-kV transmission lines. The preferred locations for these facilities were determined through a rigorous siting process, which included evaluations of natural and cultural features, land use, engineering attributes, and cost. The preferred locations are illustrated in Figure S-1. The substation would be located on Coleman Hill Road, about 4 miles east of U.S. Alternate Highway 31/41. A 27-mile 500-kV transmission line would be built on vacant, TVA-owned ROW between TVA's existing Maury 500-kV Substation and the proposed new substation. A 9-mile 161-kV transmission line would connect the new substation to MTEMC's existing Almaville 161-kV Substation; 6 miles of this line would be on vacant TVA-owned ROW, and the remainder would be on new ROW. A 15-mile 161-kV transmission line on new ROW would connect the new substation to MTEMC's existing Christiana 161-kV Substation.

The preferred substation site and transmission line routes have been adjusted from the original proposal based on public and property owner input and to minimize overall project impacts. Compared to the other potential sites and route combinations, the preferred site and routes are expected to have the least overall project impacts and be the most cost-effective solution.

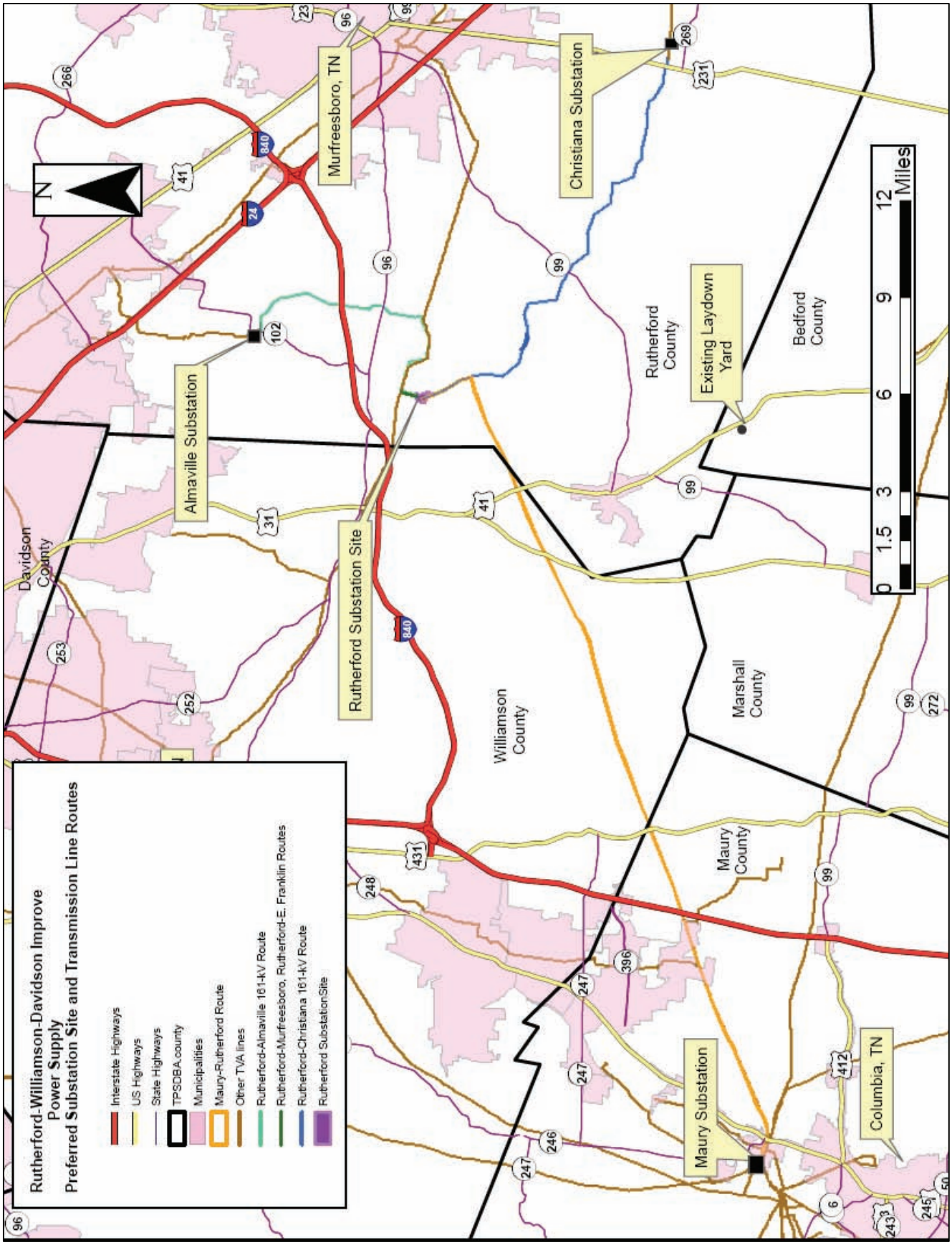


**Figure S-1. Map of the Proposed Rutherford 500-kV Substation and Associated 500-kV and 161-kV Transmission Lines**

## AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

### Groundwater

The project area is underlain by limestone aquifers in Ordovician-aged rocks, in what is known as the Central Basin aquifer system. The carbonate or limestone rocks that form the Central Basin aquifer are susceptible to erosion and dissolution and are typical of karst systems. Karsts are characterized by sinkholes, springs, disappearing and reappearing streams, and caves. Groundwater in karst systems is easily contaminated since the waters can travel long distances through conduits with no chance for natural filtering processes of soil or bacterial action to reduce the contamination. Much of the proposed project area is underlain by karst terrain, and the proposed ROWs intersect a total of 68 karst features.

In the Rutherford-Williamson-Maury tri-county area, the groundwater in the Ordovician aquifers is considered hard and contains high concentrations of dissolved solids, chlorine, and iron. These concentrations, however, are equal to or less than U.S. Environmental Protection Agency's (USEPA) secondary maximum contaminant levels for drinking water. The quality of the water generally is adequate for domestic use, or it can be treated and made adequate for most uses. Public drinking water for Rutherford, Williamson, and Maury counties is supplied by both surface water and groundwater sources. A State Designated Source Water Protection Area is located within the project area.

#### *Alternative 1 – The No Action Alternative*

Under the No Action Alternative, the Rutherford Substation and the Maury, Almaville, and Christiana transmission lines would not be built, resulting in no environmental impacts to groundwater.

#### *Alternative 2 – The Action Alternative*

TVA best management practices (BMP) would be used during construction and operation of the proposed substation and transmission lines to avoid many impacts on groundwater and to control storm water runoff and sediment infiltration. Only USEPA-registered herbicides would be applied in accordance with manufacturers' directions. Herbicides with groundwater contamination warnings would not be used in areas where karst features occur. These areas include the proposed ROW between Double Branch and Double Branch Road, Greens Mill Road and Cornstock Road, Cross Keys Flat to Boon Creek, along the Almaville Transmission Line between the intersection of the Murfreesboro-Triune-East Franklin 161-kV Transmission Line, north to where the transmission line turns west, on the Christiana Transmission Line between Coleman Hill Road south to Panther Creek Road and within 500 feet of the entrance to Nanna Cave. No fertilizers would be used in the groundwater source protection zone from Windrow Road to the end of the Maury Transmission Line.

A septic system to serve the proposed substation site would be built on the substation site following regulations of Tennessee Department of Environment and Conservation's (TDEC) permitting process. The use of BMPs and oil contaminant facilities would ensure that groundwater is not affected by the proposed substation.

With the use of TVA BMPs and use of control measures normally applied by TVA, potential effects to groundwater quality would be insignificant.

**Surface Water**
The project area drains to tributaries of the Harpeth River, Stones River, Duck River, and Cheatham Reservoir in the Cumberland River basin and Kentucky Reservoir in the Tennessee River basin.

Larger named streams include Overall Creek, Panther Creek, West Fork of the Stones River, Harpeth River, Rutherford Creek, Double Branch, Crooked Creek, Little Flat Creek, and Nelson Creek. Most of these streams are classified for fish and aquatic life, recreation, irrigation, and livestock watering and wildlife. West Fork of the Stones River, Harpeth River, and Rutherford Creek have the additional classifications of domestic and industrial water supply. The proposed Maury Transmission Line route would cross the Nationwide Rivers Inventory- (NRI) listed Harpeth River, and this transmission line and the Almaville Transmission Line would be within 3.0 miles of another NRI stream.

Several streams in the project area are assessed by the State of Tennessee on the 2006 TDEC 303(d) list as impaired because of pollutant loadings that exceed established water quality standards.

***Alternative 1 – The No Action Alternative***
Under the No Action Alternative, the Rutherford Substation and the Maury, Almaville, and Christiana transmission lines would not be built; therefore, no environmental impacts to surface water would occur.

***Alternative 2 – The Action Alternative***
Construction of the proposed transmission lines would require crossing several streams, including the Harpeth River. Potential impacts to streams include siltation and removal of streamside tree canopy. These impacts would be minimized through avoiding stream crossings where possible, by implementation of BMPs, and by minimizing vegetation clearing on stream banks. Impacts to surface waters are expected to be insignificant.

**Aquatic Ecology**
Streams of the Nashville Basin are characterized by low to moderate gradient and are virtually paved in some areas with expanses of limestone bedrock interspersed with rock rubble riffle areas, silty basins, and some sand and gravel reaches. Many streams are dry and reduced to isolated pools or are subterranean during the late summer and fall. The limestones freely leach nutrients and, consequently, waters are very productive, and algae and rooted vegetation are abundant in streams. The upper Duck, Stones, and Harpeth rivers support diverse aquatic communities. These rivers support 102, 72, and 64 native fish species, respectively. Other types of aquatic life are expected to be similarly diverse in these drainages.

***Alternative 1 – The No Action Alternative***
Under the No Action Alternative, the Rutherford Substation and the Maury, Almaville, and Christiana transmission lines would not be built; therefore, no environmental impacts to aquatic ecology would occur.

***Alternative 2 – The Action Alternative***
Aquatic life can be impacted either directly by alteration of habitat conditions within the streambed or indirectly due to modification of the riparian zone and storm water runoff resulting from construction and maintenance activities along the transmission line route. Potential impacts due to removal of streamside vegetation within the riparian zone include

increased erosion and siltation, loss of instream habitat, and increased stream temperatures. Other potential construction and maintenance impacts include alteration of stream banks and stream bottoms by heavy equipment and runoff of herbicides into streams. Although the potential for impacts varies among the transmission line ROWs, overall impacts to aquatic ecology, with implementation of protective measures, are expected to be insignificant.

**Vegetation**
Forest, pasture, and cropland are the dominant cover types in this region. Major plant community types in this study area are oak-hickory forest, mesic maple forest, riparian forest, mixed evergreen-deciduous and evergreen forest, herbaceous vegetation, and limestone cedar glades.

The Nashville Basin ecoregion is a floristically diverse area that harbors a number of rare plant communities. Ten rare community types are known from the Maury, Williamson, and Rutherford county area. Of these, four are associated with limestone glades and occur in the areas of the proposed transmission lines and substation. These communities include the Central Basin Glade Margin Shrubland, Interior Low Plateau Limestone Glade Ephemeral Pool, Limestone Seep Glade, and Limestone Annual Grass Glade. Limestone glades are perhaps the most unique vegetation types occurring on shallow soil and large outcrops of limestone common in the region. Glade communities typically are rich in endemic plant species (plants that grow in no other habitat); at least 22 plant species are endemic to limestone glades and four of these plant species are found only in Middle Tennessee.

***Alternative 1 – The No Action Alternative***
Under the No Action Alternative, the Rutherford Substation and the Maury, Almaville, and Christiana transmission lines would not be built; therefore, no environmental impacts to vegetation would occur.

***Alternative 2 – The Action Alternative***
Construction of the proposed substation would permanently remove vegetation on much of the Rutherford Substation site and would alter vegetation on virtually the entire site. Over 95 percent of the site is highly disturbed herbaceous vegetation, and no uncommon or high quality terrestrial plant communities occur on the site.

Construction, operation, and maintenance of the substation and transmission lines would result in the clearing of approximately 370 acres of forested land to accommodate the proposed new Maury, Almaville, and Christiana transmission lines. This would result in the long-term conversion of forested areas to early successional habitats. Maury, Williamson, and Rutherford counties, where these sections of transmission line are located, have experienced an 8 percent, 4 percent, and greater than 16 percent increase in total forest cover between 1989 and 2004, respectively. The conversion of 370 acres of forestland to ROW is offset by the more than 40,000-acre increase in forestland that has occurred in the counties since 1989. To minimize impacts to rare communities, vehicle access and herbicide use would be prohibited at locations where these communities are found.

**Wildlife**
The project area is heavily disturbed and shaped by previous agricultural, forestry, and development practices. Common habitat types in the project area include early successional habitats (52 percent) composed of existing ROW, pasture, cropland, shrubland, limestone cedar glades, and forested habitats (48 percent). The forested habitat

occurs mostly in fragments, but over 600 acres of contiguous forest exist on Indian Mountain and Scales Mountain near the proposed Almaville Transmission Line ROW. The composition and abundance of wildlife species in terrestrial environments of the project area vary with habitat type and size, food availability, surrounding land use, and other limiting factors. Similar species of wildlife occur throughout each section of this project.

Eight caves occur within 3 miles of the project area, and several other entrances of the Snail Shell Cave System occur near the Christiana Transmission Line section. No heron colonies occur in the project area.

***Alternative 1 – The No Action Alternative***
Under the No Action Alternative, the Rutherford Substation and the Maury, Almaville, and Christiana transmission lines would not be built; therefore, no environmental impacts to wildlife would occur.

***Alternative 2 – The Action Alternative***
Potential impacts to wildlife would result from the long-term conversion of forest to early successional habitats and from the creation of forest-edge habitat. This would be detrimental to forest-dwelling wildlife but beneficial to species requiring early successional grasslands/shrub habitats.

Pollution from chemicals and sedimentation from disturbed soil could impact nearby caves; however, a 500-foot-radius buffer area would be established during the construction and maintenance of the transmission lines.

Although wildlife populations would likely become more isolated from the continued development of the area, overall significant impacts to terrestrial wildlife and their habitats is not expected, as the surrounding landscape is already highly disturbed from previous agricultural and forestry practices, and from current development.

**Endangered and Threatened Species**
Four federally listed as endangered aquatic species (birdwing pearlymussel, Cumberland monkeyface, orange-foot pimpleback, and tan riffleshell), two aquatic candidate species for federal listing (rayed bean and slabside pearlymussel), as well as several state-listed aquatic species occur in potentially affected stretches of the Duck and Harpeth rivers and their tributaries. A portion of the Duck River downstream of the project area is also designated critical habitat for for the oyster mussel and Cumberlandian combshell.

Two federally listed plant species (Braun's rock-cress and Pyne's ground-plum), as well as designated critical habitat for Braun’s rock-cress occur in the project area. Nine state-listed plants were also observed in the project area. Most of the listed plants occur in limestone glades.

Gray bat and Indiana bat, both federally listed as endangered, have been previously reported in the project area. No caves suitable for either of these species occur in the immediate vicinity of the project components; potential roost habitat for the Indiana bat is present. A few state-listed species are known to occur or potentially occur in the project area; these species occupy caves or limestone glade habitat.

***Alternative 1 – The No Action Alternative***
Under the No Action Alternative, the Rutherford Substation and the Maury, Almaville, and Christiana transmission lines would not be built; therefore, no environmental impacts to endangered or threatened species would occur.

**Alternative 2 – The Action Alternative**
With the implementation of BMPs and streamside management zones, any effects on federally or state-listed aquatic species as a result of construction, operation, and maintenance of the proposed project would be short term and insignificant. Construction, operation, and maintenance of this transmission line is not likely to adversely affect the above listed aquatic species or the designated critical habitat.

The proposed action would adversely affect populations of the state-listed plants water stitchwort, ramps, limestone fameflower, Canada lily, and Tennessee milk-vetch. There are numerous other populations of each of these species in Tennessee, and many of these populations are on areas managed to conserve them. The adverse effects resulting from the proposed action would not adversely affect the species or their viability in Tennessee. In order to avoid adverse impacts to other state-listed plants, TVA would avoid the areas during construction and maintenance, unless there is no practical alternative. TVA also proposed several mitigation measures to further reduce these potential impacts. With the implementation of these mitigation measures, impacts to other state-listed plants would not be adverse.

The proposed transmission line routes were modified during the planning process to reduce the potential impacts to Pyne's ground-plum, Braun's rock-cress, and critical habitat for Braun's rock-cress. TVA also proposed several mitigation measures to further reduce these potential impacts. With the implementation of these mitigation measures, TVA has determined that Pyne's ground-plum and Braun's rock-cress would not be adversely affected and the critical habitat for Braun's rock-cress would not be adversely modified.

In order to minimize impacts to potential habitat for the Indiana bat, TVA would implement the mitigation measures on the timing of timber harvesting. TVA has determined that effects on the Indiana bat would not be adverse with implementation of this measure. With implementation of mitigation measures for the protection of caves, impacts on state-listed animals would be insignificant.

In accordance with the regulations implementing Section 7 of the Endangered Species Act, TVA is consulting with the U.S. Fish and Wildlife Service on its determination of no adverse effects on federally listed species and no adverse modification of critical habitat.

**Wetlands**
Thirteen wetlands having a combined area of 3.43 wetland acres were identified on the proposed substation site and within the ROWs of the proposed transmission lines. Of the 3.43 acres, 2.29 acres were forested with 2.04 considered of moderate quality and degraded but with a reasonable potential for restoration, and 0.1 acre was of very high quality or of regional/statewide concern.

A 0.49-acre emergent wetland of moderate quality occurs on the proposed substation site. Approximately 0.64 acres of forested wetland occurs within the proposed Maury Transmission Line ROW. The proposed Almaville Transmission Line ROW contains

approximately 0.02 acre of forested wetland, and the proposed Christiana Transmission Line ROW contains 1.63 acres of forested wetland.

***Alternative 1 – The No Action Alternative***
Under the No Action Alternative, the Rutherford Substation and the Maury, Almaville, and Christiana transmission lines would not be built; therefore, no environmental impacts to wetlands would occur.

***Alternative 2 – The Action Alternative***
The construction and operation of the proposed Rutherford Substation would not directly affect wetlands. The construction and operation of the proposed transmission lines would result in the long-term conversion of 2.29 acres of forested wetlands to scrub-shrub/emergent wetlands. This is not anticipated to result in significant direct or cumulative impacts to wetlands in the project area.

Potential impacts to all other wetland areas resulting from possible access across these wetlands during the proposed transmission line construction would be minimized sufficiently with BMPs. Similarly, BMPs would be used for all transmission line maintenance activities to ensure that wetland impacts are temporary and insignificant.

**Floodplains**
The proposed Maury, Almaville, and Christiana transmission line segments cross the 100-year floodplain of several rivers and streams. The proposed Rutherford 500-kV Substation in western Rutherford County is located outside the boundaries of the 100-year floodplain.

***Alternative 1 – The No Action Alternative***
Under the No Action Alternative, the Rutherford Substation and the Maury, Almaville, and Christiana transmission lines would not be built; therefore, no environmental impacts to floodplains would occur.

***Alternative 2 – The Action Alternative***
The proposed Rutherford Substation in Rutherford County would be above the 100-year floodplain and would therefore have no floodplain impacts.

The proposed Maury, Almaville, and Christiana Transmission Line routes cross several floodplain areas in Maury, Williamson, and Rutherford counties. Consistent with Executive Order (EO) 11988, an overhead transmission line and related support structures are considered repetitive actions in the 100-year floodplain. The construction of the support structures for the transmission line would not be expected to result in any increase in flood hazard either as a result of increased flood elevations or changes in flow-carrying capacity of the streams being crossed. Some of the access roads would involve construction in the 100-year floodplain. Consistent with EO 11988, a road is considered as a repetitive action in the 100-year floodplain. To minimize adverse impacts, any road construction in the 100-year floodplain would be done in such a manner that upstream flood elevations would not be increased.

**Managed Areas**
Managed areas and/or ecologically significant sites and streams listed on the Nationwide Rivers Inventory occur within 3 miles of the proposed Rutherford Substation and the three associated transmission lines.

The proposed 53.1-acre substation iis within 1 mile of two Registered State Natural Areas (SNAs): Scales Mountain Knobs and Indian Mountain. Large portions of both SNAs are listed as designated critical habitat for Braun's rock-cress. The proposed Maury Transmission Line route would cross the NRI-listed Harpeth River, come within 0.5 mile of Haley-Jaqueth Wildlife Management Area (WMA), and would be within 3.0 miles of another NRI stream and three other natural areas. The proposed Almaville Transmission Line route would cross small portions of the two above-listed SNAs and is within 3.0 miles of an NRI stream. The proposed Christiana Transmission Line route would cross the NRI-listed West Fork of the Stones River, is within 0.5 mile of one managed area (Snail Shell Cave Preserve), and is within 3.0 miles of two NRI streams and one managed area.

***Alternative 1 – The No Action Alternative***
Under the No Action Alternative, the Rutherford Substation and the Maury, Almaville, and Christiana transmission lines would not be built; therefore, no environmental impacts to managed areas would occur.

***Alternative 2 – The Action Alternative***
The proposed substation is of sufficient distance from Scales Mountain Knobs SNA (0.8 mile) and Indian Mountain SNA (1.0 mile) that no impacts to these natural areas are anticipated from the construction and operation of the proposed substation. The proposed Almaville Transmission Line would cross small portions of these SNAs. New crossings of two NRI streams—the Harpeth by the Maury Transmission Line and West Fork of the Stones River by the Christiana Transmission Line—would result in diminished scenic integrity of the streams, but no significant impacts to the streams' other recognized values. No impacts to the Haley-Jaqueth WMA or Snail Shell Cave Preserve that are within 0.5 mile of the proposed work or to other NRI streams or natural areas within 3.0 miles of the proposed work are anticipated.

**Recreation**
Primary recreational activities that occur in the project area are informal, dispersed, and occur on privately owned land. These include hunting, fishing, walking, horseback riding, off-road vehicle use, and nature viewing. There are no developed public recreation facilities near the proposed substation and transmission line routes.

***Alternative 1 – The No Action Alternative***
Under the No Action Alternative, the Rutherford Substation and the Maury, Almaville, and Christiana transmission lines would not be built; therefore, no environmental impacts to recreational activities would occur.

***Alternative 2 – The Action Alternative***
Implementation of the Action Alternative would result in insignificant effects on public recreation activities and resources.

**Land Use and Prime Farmland**
The project involves the construction of about 51 miles of new transmission lines and a 500-kV substation in Rutherford County that would occupy 53.1 acres. The construction of transmission lines and their support structures would not render farmland unusable, because the transmission line ROWs can still be farmed. Only the land occupied by the substation would be converted to nonfarm use. The proposed substation site is mostly unimproved pastureland, part of which has been occasionally harvested for hay.

***Alternative 1 – The No Action Alternative***
Under the No Action Alternative, the Rutherford Substation and the Maury, Almaville, and Christiana transmission lines would not be built; therefore, no environmental impacts to land use or prime farmland would occur.

***Alternative 2 – The Action Alternative***
Form AD 1006, "Farmland Conversion Impact Rating" was completed with a score of 57 out of a possible maximum of 100 points. The "Total Site Assessment" score was 80 out of a possible maximum of 160 points. The total points for the proposed substation site; i.e., the "Farmland Conversion Impact Rating" is 137. This indicates the site's relative value as prime farmland is not high enough to be considered for protection under the Federal Farmland Protection Policy Act.

**Visual Resources**
The proposed substation and transmission line routes cross diverse landscapes including the Harpeth River, several streams, areas of farms, forest, and low density residential development, as well as areas of higher density residential development and commercial development near Columbia. Near the proposed substation, scenic attractiveness is common, and scenic integrity is low due to human alterations of naturally evolving landscapes that are now agriculture and grazing lands.

Scenic attractiveness is minimal to common, and scenic integrity is low to moderate over most of the length of the transmission line routes. In the area near Indian Mountain and Scales Mountain Knob Registered SNAs, scenic attractiveness is distinctive, and scenic integrity is moderate. This area has little public access and is a major focal point in the landscape from all directions due to their prominent peaks.

***Alternative 1 – The No Action Alternative***
Under the No Action Alternative, the Rutherford Substation and the Maury, Almaville, and Christiana transmission lines would not be built; therefore, no environmental impacts to visual resources would occur.

***Alternative 2 – The Action Alternative***
Construction and operation of the proposed substation and transmission lines would result in long-term changes in visual character of the area resulting from the clearing of the ROW and the construction of metal transmission line support structures and transmission line conductors.

The proposed substation and transmission line routes cross diverse landscapes including the Harpeth River, several streams, areas of farms, forest, and low density residential development, as well as areas of higher density residential development and commercial development near Columbia. Near the proposed substation, scenic attractiveness is common, and scenic integrity is low due to human alterations of naturally evolving landscapes that are now agriculture and grazing lands. Scenic attractiveness is also common, and scenic integrity is low to moderate over most of the length of the transmission line routes. In the area near Indian Mountain and Scales Mountain Knob Registered SNAs, scenic attractiveness is distinctive, and scenic integrity is moderate. This area has little public access and is a major focal point in the landscape from all directions due to their prominent peaks.

***Alternative 1 – The No Action Alternative***
Under the No Action Alternative, the Rutherford Substation and the Maury, Almaville, and Christiana transmission lines would not be built; therefore, no environmental impacts to visual resources would occur.

***Alternative 2 – The Action Alternative***
Construction and operation of the proposed substation and transmission lines would result in long-term changes in visual character of the area resulting from the clearing of the ROW and the construction of metal transmission line support structures and transmission line conductors.

Visual impacts from the Rutherford Substation construction would be minimal. Existing mature vegetation that would remain on the south and west sides of the substation, as well as undulating topography, would obscure most views. There may be some visual discord during the construction period due to an increase in the number of commercial vehicles accessing the site from Patterson Road. However, this would be temporary until all activities are complete. New substation lighting would comply with the TVA's standard substation lighting guidelines.

The new transmission line and structures would add to the number of discordantly contrasting elements seen in the landscape. Vegetation removal for new ROW would reduce scenic integrity in areas unaltered by human development. However, scenic class for any of the proposed transmission line sections or substation site would likely not be reduced by two levels or more, the threshold of significance.

**Cultural Resources**
Historic properties, identified for their architectural/historical or archaeological significance, occur within the project area. The Rutherford Substation area of potential effect (APE) for archaeological resources consists of a 78-acre footprint including an access road. The APE for archaeological investigations also includes a 0.5-mile radius surrounding the substation footprint. Two ineligible archaeological sites, 13 previously recorded archaeological properties, and six previously recorded ineligible historic buildings were identified.

The Maury Transmission Line route APE contains nine previously recorded ineligible archaeological sites, one previously recorded potentially eligible archaeological site, and six previously unrecorded ineligible sites. Additionally, 70 previously recorded architectural properties occur within this APE. Of these, since their initial recordation, 35 have been destroyed, 12 are located outside the visual site of the Maury Transmission Line route, and 23 are ineligible due to their lack of architectural distinction and loss of integrity caused by modern alterations and/or damage. Three National Register of Historic Places- (NRHP) listed properties—William Ogilvie house, William Allison house, and Smithson-McCall farm—are located within the Maury Transmission Line APE. Thirty-one other previously unrecorded ineligible architectural sites were also identified.

Fifteen previously recorded ineligible architectural resources, one previously unrecorded ineligible architectural resource, and one previously unrecorded ineligible archaeological site were identified within the proposed Almaville Transmission Line APE.

Two previously unrecorded archaeological sites, 34 previously recorded ineligible architectural resources, one NRHP-listed property, and 15 previously unrecorded

architectural resources were identified within the proposed Christiana Transmission Line APE. The Rockvale Store is NRHP-listed; however, since its listing, the building has been severely altered and does not retain sufficient integrity to remain listed.

***Alternative 1 – The No Action Alternative***
Under the No Action Alternative, the Rutherford Substation and the Maury, Almaville, and Christiana transmission lines would not be built; therefore, no environmental impacts to cultural resources would occur.

***Alternative 2 – The Action Alternative***
The construction and operation of the proposed substation would not affect historic properties. The construction and operation of the Maury Transmission Line would not affect any listed or eligible archaeological sites. The William Ogilvie house, which is listed on the NRHP, no longer retains sufficient integrity for listing on the NRHP. Thus, the Maury Transmission Line would have adverse visual effects on two historic properties, the William Allison house and Smithson-McCall farm, listed on the NRHP. Neither the Almaville Transmission Line nor the Christiana Transmission Line would affect historic properties eligible for or listed on the NRHP.

In order to avoid adverse effects to archaeological site 40WM35, TVA would not place transmission line structures within the site or cause other ground disturbance of the site. If impacts to the site cannot be avoided in this manner, TVA would conduct further Phase II archaeological testing to identify locations for structure placement that would not adversely affect the site.

The Tennessee SHPO has concurred with TVA's determinations for the substation, the Almaville Transmission Line, and the Christiana Transmission Line in letters dated August 16, 2007, and August 23, 2007. In a letter dated June 29, 2007, the SHPO concurred with TVA's finding of adverse effects on the William Allison house and Smithson-McCall farm. TVA is presently developing a memorandum of agreement with the SHPO and other interested parties that will prescribe treatment measures to be undertaken by TVA to mitigate these adverse effects.

**Socioeconomics**
Rutherford County has a total population of 229,000 and with 370 persons per square mile is 2.5 times more densely populated than the state average. Williamson County has a population of about 161,000 and Maury County of about 78,000. All of these counties have experienced significant population growth in recent years.

Potential socioeconomic effects from the construction and operation of the proposed substation and transmission lines include changes in population, employment, housing, retail sales, property tax, and property values. These effects generally would be relatively similar across the project area.

***Alternative 1 – The No Action Alternative***
Under the No Action Alternative, the Rutherford Substation and the Maury, Almaville, and Christiana transmission lines would not be built; therefore, no environmental impacts to socioeconomic conditions would occur.

***Alternative 2 – The Action Alternative***
This substation and transmission line project would have no effect on population in the area; it is instead a response to growth already occurring and projected to continue in the Middle Tennessee area. Construction would involve a relatively small crew of workers for a few months. Due to the nature of the project, most workers probably would either move in temporarily or commute from their current homes, especially within 50 or 60 miles. Consequently, there would be little or no change in employment of local workers. Little impact on housing is anticipated since many of the construction workers who move temporarily into the area likely would rent motel rooms or provide their own lodging using campers or trailers.

Some local business income and local government revenues would be generated during the construction period from purchases of items such as meals and from lodging or campground rental fees. The impacts of this additional revenue would be small. Some construction materials could be purchased locally, but due to their nature, most of the purchases would likely be outside the area. The increase in local tax revenues generally would not be noticeable.

Potential impacts to property values in the range of 5 to 10 percent are possible for properties adjacent to a transmission line. The size of the impact appears to be sensitive to distance, with little or no impact to properties not adjacent or very close. According to the Electric Power Institute, the impacts on property value tend to diminish over time, and some studies have found that they virtually disappear in about five years. Therefore, no significant adverse impacts on property values are expected.

**Environmental Justice**
There is a potential for environmental justice impacts (disproportionate impacts on low-income and minority populations) as a result of the construction and operation of the proposed substation and transmission lines. These effects generally would be relatively similar across the project area.

The area around the proposed project area has a very small minority population. The largest minority population occurs in areas in Maury County, all of which have minority populations smaller than the county, state, and national averages, and one area in Williamson County that is higher than the county average but well below the state and national averages. Poverty levels are generally below the state and national levels. The proposed route is generally not densely populated, although there are occasional subdivisions in view.

***Alternative 1 – The No Action Alternative***
Under the No Action Alternative, the Rutherford Substation and the Maury, Almaville, and Christiana transmission lines would not be built; therefore, no environmental justice impacts would occur.

***Alternative 2 – The Action Alternative***
Due to the location of the proposed route and to the overall small share of minority and low-income residents, no environmental justice impacts are anticipated.

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# ACRONYMS, ABBREVIATIONS, AND SYMBOLS

| | |
|---|---|
| **A** | Alternate Highway |
| **AMA** | American Medical Association |
| **APE** | Area of Potential Effect |
| **ARAP** | Aquatic Resource Alteration Permit |
| **BG** | Block Group |
| **BMP(s)** | Best Management Practice(s) |
| **CFR** | Code of Federal Regulations |
| **CT** | Census Tract |
| **DCH(s)** | Designated Critical Habitat(s) |
| **EIS** | Environmental Impact Statement |
| **ESA** | Endangered Species Act |
| **EMF(s)** | Electric and Magnetic Field(s) |
| **EO** | Executive Order |
| **GIS** | Geographic Information System |
| **I-** | Interstate Highway |
| **ibid** | Abbreviation for the Latin term, *ibidem*, meaning “in the same place;” refers to the immediately preceding work cited |
| **kV** | Kilovolt (equal to one thousand volts) |
| **MTEMC** | Middle Tennessee Electric Membership Corporation |
| **MW** | Megawatt (equal to one million watts) |
| **n.d.** | No Date (pertains to date Web site was accessed; abbreviation is shown in the Literature Cited section) |
| **NEPA** | National Environmental Policy Act |
| **NIEHS** | National Institute of Environmental Health Sciences |
| **NOI** | Notice of Intent |
| **NPS** | National Park Service |
| **NRHP** | National Register of Historic Places |
| **NRI** | Nationwide Rivers Inventory |
| **OSHA** | Occupational Safety and Health Administration |
| **RM** | River Mile |
| **ROW(s)** | Right(s)-of-Way |
| **SHPO** | State Historic Preservation Officer |
| **SMZ(s)** | Streamside Management Zone(s) |
| **SNA(s)** | State Natural Area(s) |
| **spp.** | Species |
| **SR(s)** | State Route(s) |
| **ssp.** | Subspecies |
| **TDEC** | Tennessee Department of Environment and Conservation |
| **TVA** | Tennessee Valley Authority |
| **TVARAM** | TVA Rapid Assessment Method |
| **TWRA** | Tennessee Wildlife Resources Agency |
| **US** | U.S. Highway |
| **USACE** | U.S. Army Corps of Engineers |
| **USEPA** | U.S. Environmental Protection Agency |
| **USFS** | U.S. Forest Service |
| **USFWS** | U.S. Fish and Wildlife Service |
| **USGS** | U.S. Geological Survey |
| **WHO** | World Health Organization |
| **WMA** | Wildlife Management Area |
| **WWC(s)** | Wet-Weather Conveyance(s) |

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